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Implementation of Lean Six Sigma to Improve Productivity and Performance of Relationship Manager Lending PT. XYZ in Jakarta

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Abstract:- In the lending process of PT. XYZ in Jakarta, an issue that growth in this market is lending disbursement that is not in agreement with the period stated by the Lending Relationship Manager. The aim of this study is to learn how to implement Lean Six Sigma, identify improvements, and determine what activities in the lending process are categorized as waste in order to improve the productivity and performance of Relationship Manager Lending PT. XYZ in Jakarta. Improvements were made by using Lean Six Sigma through the DMAIC to minimize waste by applying fishbone analysis and why analysis to identify the root of the problem and improve to such problems. The results obtained are the implementation of Lean Six Sigma in business processes, there is a time saving of 8 days or a decrease of 40% and an increase in sales target of Relationship Manager Lending PT. XYZ in Jakarta in 2021 is 8.92%.

Keyword:- *DMAIC, fishbone analysis, Lean Six Sigma, waste, why analysis.*

I. INTRODUCTION

The banking sector is always confronted with a situation in which public demand for savings and lending services rises year after year. The banking industry, both domestically and internationally, has now joined the digital era. Starting with bank services that do not require an office to transactions that are currently prevalent through e-channels. In order to continue to attract clients, banks must be able to adapt and develop, which means they must be able to innovate in the financial sector. The banking industry, both domestically and internationally, has now joined the digital era. Starting with bank services that do not require an office to transactions that are currently prevalent through e-channels. In order to continue to attract clients, banks must be able to adapt and develop, which means they must be able to innovate in the financial sector. The banking industry is becoming increasingly competitive, especially with the emergence of Financial Technology (Fintech), which is also fast expanding. The development of a variety of digital financial services by non-banking organizations or start-ups that can.According to preliminary study (Pre-Survey) conducted at PT. XYZ in Jakarta prior to the research, the lending application process became the main problem, as shown in the following table 1:

No	The issue (trouble) with PT. XYZ's lending application process in Jakarta	Impact
1	Prospective clients are not informed about the lending application process, which is still being reviewed by the lending team, according to Relationship Manager Lending.	Prospective debtors are ignorant of the situation and opt for a different bank.
2	Overly extended lines of lending are considered bad.	Prospective debtors are switching to other banking firms.
3	Setting policies or SOPs is unrealistic and ineffective.	Prospective debtors have to wait a little longer.
4	The Lending Application Form's system input is subject to error.	This should take more time to process.
5	Fulfillment of excessively complex requirements documents.	Potential debtors are dissatisfied.
6	Methods of validation that are sometimes lengthy and inconvenient	Potential debtors are dissatisfied and distrustful.
7	The bank's survey and interview process, which has been repeated several times.	Potential debtors are dissatisfied.
8	Disbursement that is not on time as promised	Potential debtors are dissatisfied.
9	The banks didn't notify me that the lending request was rejected.	Potential debtors are dissatisfied.
10	After-sales service is lacking.	Potential debtors are dissatisfied.

Table 1: Problems that often occur in the lending application process for PT. XYZ in Jakarta

Source: Data Pre Survey PT. XYZ in Jakarta (2021)

Based on the table, researchers can obtain a better understanding of the issues that frequently arise in the lending application process for PT. XYZ in Jakarta. The implementation of Lean Six Sigma is expected to increase the velocity in the lending application process for PT. XYZ in Jakarta, allowing it to become a continuous improvement activity to improve the productivity and performance of Relationship Managers Lending in terms of meeting the set targets.

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According to Karlisson J. (2010), the use of Six Sigma in the loan application process at the Swedish Bank has shown to save costs and time. The Six Sigma method focuses on measurable bottom-line results that are backed up by a positive work culture in the banking industry. On integrating the DMAIC model with knowledge management, money. L. and Hussain. I. (2011) suggest that the Six Sigma technique has a significant impact on the quality of increasing banking performance in China. For ensure the success of banking business and operational activities, Sunder, V. (2016) concludes that alignment between Six Sigma and knowledge management is critical. As according Budiwati (2017), banks might be able to identify the particular demands of each client, eliminate inefficiency in bank business operations, and improve customer satisfaction with quality services using the Lean Six Sigma technique. The use of Lean Six Sigma in the banking sector, according to Mahdani, M. (2018), improves operational efficiency, cost effectiveness, and provides quality service that meets consumer expectations. Sanadid, GB, and Dalimot, MM, (2019) also found that Lean Six Sigma was very beneficial in the Philippines in practically all areas of operational and financial management. That according Hernadewita, H., Ismail, H., Nurdin, M., and Kusumah L. (2019), corrective steps must be made using the findings analysis to reduce the kind of defect with a production sigma value after the implementation of sigma of 3.6 to achieve Six Sigma. The use of six sigma, FMEA, and 5W+1H increases company performance and product quality, according to Aditama, R., and Imaroh, S., T. (2020).

The study intended to carry out research titled Implementation of Lean Six Sigma to Increase Productivity and Performance of Relationship Managers Lending PT. XYZ in Jakarta basing on the description of the issue's background.

Based on the aforementioned, the problem in this study is how to implement Lean Six Sigma to improve the productivity and performance of Relationship Manager Lending PT. XYZ in Jakarta?, how to make improvements to minimize waste in improving the productivity and performance of Relationship Manager Lending PT.XYZ in Jakarta?, and also what activities are classified as waste in the lending process?

The purpose of this study is seeing how integrating Lean Six Sigma into the lending process will result in recommendations for improving the productivity and effectiveness of Relationship Managers. In the process of issuing lendings to PT. XYZ in Jakarta, to identify the improvement of PT. XYZ in Jakarta implementation the Lean Six Sigma methods, and to identify out what activities are categorized as waste.

II. LITERATUR REVIEW

That according Liker (2004), Toyota was the first to adopt Lean, which is also known as the Toyota Production System, with the purpose of improving quality, lowering costs, and increasing delivery accuracy by speeding up the production process and eliminating waste. Lean is a set of tools and strategies for eliminating waste, reducing waiting times, continuous improvement, and reducing prices in all processes, with the purpose of maximising process efficiency. According to Gasperz (2007) Lean is a continuous effort (continuous improvement effort) to eliminate waste and increase value to customers. Lean can be defined as a systematic method to identifying and eliminating waste or non-value added activities through radical continuous improvement employing a pull system and internal and external customers to attain excellence and perfection. According to Hill, J., Thomas, AJ, Mason-Jones, R. K., and El-Kateb, S. (2017), Six Sigma is a quality control and improvement method used by Motorola since 1986, and it is a new breakthrough in the field of quality management. Six sigma is a flexible and comprehensive system for obtaining, sustaining, and maximizing corporate success.

According to Sutawijaya, A.H, Nawangsari, L.C, and Djamil, M. (2019), Six Sigma is a new management method that will be used to supplant Total Quality Management (TQM), which focuses on quality control by looking at the company's entire production system. Its purpose is to eliminate manufacture faults, reduce product manufacturing time, and reduce costs. The goal is to keep the variation in expenditures below the six standard deviations (Sigma) between the average (mean) and the closest breakdown limit. Six Sigma is a process-oriented methodology that focuses on both the manufacturing and service processes. The following are some of the benefit of implementing Six Sigma: as an essential to creating a company successful and continuing to develop effectively to produce sustainable success, Six Sigma implementation has a high chance of success, is more appealing and valuable, process improvement is faster, improves processes while maintaining quality, and provides long-term benefits for the company. The steps of Six Sigma are Define, Measure, Analyze, Improve, and Control (DMAIC).

- Define is the phase of determining the problem by evaluating customer requirements through Critical to Quality (CTQ), particularly regarding: (a) determining customer requirements by forming a team, and (b) identifying problems and determining priority issues using tools such as Cause and Effect Charts and Pareto chart (Pareto Chart). Aspects in determining the problem include: (1) specificity, including includes describing clearly the origin of the problem, the location of the incorrect component of the process, and the subject matter; (2) observation with real evidence; (3) measurement; and (3) control.
- Measure is a step that involves assessing the present standard of performance in order to identify the level of customer defect. Process capacity analysis is carried out by comparing the performance of a process to its

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requirements, and problem measurement system analysis is reported in variance.

- Analyze is a phase of finding and determining the root cause of the problem, using a Pareto diagram (Pareto Chart) to determine the main priority of the problem being handled by grouping 80-20, meaning that 20% of defects will cause 80% of problems, using a cause-and-effect diagram and Effect Charts or Fishbone diagrams.
- 4.Improve, the step of improving the process to reduce the factors that cause defects using the Design of Experiment (DoE), which involves testing by changing factor variables to determine the source of changes in response variables.
- 5.Control, the phase of monitoring process performance and ensuring that defects do not return through the use of tools, including such control charts, which help to reduce variability, monitor performance at any time, and allow for improvement processes to avoid rejection.

III. METHOD

A. *Research design*

This study explains how Lean Six Sigma enhances the productivity and performance of Relationship Managers Lending in raising the number of clients of PT. XYZ in Jakarta using a qualitative and quantitative approach with a descriptive research design.

B. *Data collection technique*

- (Field Research), performed through interviews with customers of PT. XYZ in Jakarta as part of a Pre-Survey to determine issues or problems in the PT. XYZ in Jakarta lending application process.
- Secondary data, collected from PT. XYZ in Jakarta in the form of loan disbursement data for 2020, and also data on the results of Relationship Manager Lending achieving targets. The data will be collected from the Branch Manager and Area Sales Manager in 2020 and 2021, and will be employed to analyze the data at the Measure and Analyze stages to determine the Relationship Manager's performance and productivity. Lending PT. XYZ in Jakarta.

C. *Data Analysis Method*

The data analysis method used in this research isdata analysis using DMAIC (*define, measure, analyze, improve and control*) as the process flow focuses on improving quality to meet customer satisfaction.

IV. RESULTS AND DISCUSSION

The results of the Pre-Survey research, discussions with Branch Managers and Area Sales Managers, and performance and productivity data on achieving the target of Relationship Manager Lending PT. XYZ in Jakarta in 2020 were used to identify potential factors of issues that affect the obtaining of lending to PT. XYZ in Jakarta, and improvements will be made using the Lean Six Sigma (DMAIC) method, with the following stages:

A. *Define*

Identification of difficulties is performed out during the person's development by identifying the specific needs of prospective debtors, with the goal of improving business and sales operations. Lending Relationship Manager for PT. XYZ in Jakarta. The primary difficulties have been identified based on the Pre-Survey, interviews, and data acquired, including:

a) Potential business process problems
Business process procedures and mechanisms , in this case, are activities in systems and procedures that occurs in the company's business processes, documents or transaction forms used in granting lending to PT. XYZ in Jakarta

b) Potential problems in the sales process Relationship Manager Lending
In carrying out his duties Relationship Manager Lending at PT. XYZ in Jakarta In the field, there are potential problems starting from making approaches and business visits to prospective debtors in order to conduct sales , collecting data and documents needed in the lending application process to the after sales stage so that a good relationship with prospective debtors is established.

The two potential issues point to wasteful operations throughout the loan application procedure at PT. XYZ in Jakarta, which lead to dissatisfaction among potential debtors.

B. *Measure*

- Determination *of Critical to Quality* (CTQ) and *Control AnalysisChart* on the Business Process of PT. XYZ in Jakarta
  - Determination of Critical to Quality (CTQ)
    The lending application procedure for PT. XYZ in Jakarta in 2020 is known to be Critical to Quality (CTQ), 4 things directly related to business operations, based on overdue data.

No.	*Critical to Quality* (CTQ)	Amount
1.	The policies or procedures that have been established are realistic and effective.	407
2.	Lines of lending that aren't too long aren't regarded as awful.	379
3.	The bank's survey and interview process, which has been repeated several times.	250
4.	Timely disbursement	155
	Total	1191

Table 2: Critical to Quality (CTQ) of PT. XYZ in Jakarta
Source: Data Processing Results (2022)

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- Control Chart Analysis (P- Chart)
  To monitor the activity of measuring the level of Six Sigma delays (overdue) in the data analysis process in the business process of applying for lending, PT. XYZ in Jakarta, including:

- DPU (Defect Per Unit)
  $DPU = \frac{Total\ number\ of\ defect}{Total\ production\ x\ CTQ}$
  the DPU value = $\frac{1192}{6638\ x\ 4}$=0.044

- DPMO(DefectPer Million Opportunities)

  $DPMO = \frac{Total\ production\ of\ defect}{Total\ production\ x\ Oppurtnity}\ x\ 1.000.000$

  value $DPMO = \frac{1192}{6638\ x\ 4}\ x\ 1.000.000 = 44893$

- Conversion to sigma table for DPMO value is 44893 = 3.20
  Overdue %age :$p = \frac{np}{n}$
  January 2020 $p = \frac{80}{580} = 0.137$
  Overdue %age :
  Overdue %age for February 2020:$p = \frac{90}{620} = 0.145$
  Overdue %age for March 2020: $p = \frac{82}{570} = 0.143,$

- Calculating the center line or Central Line (CL)
  $CL = \bar{p} = \frac{Total\ production\ of\ defect\ per\ period}{Total\ production}$
  the value of CL =$\frac{1192}{6638} = 0.180$

- Calculating the formula for the upper control limit, often known as the Upper Control Limit (UCL), is used to compute the upper control limit:

  $$UCL = \bar{p} + \sqrt[3]{\frac{\bar{p}(1-\bar{p})}{n}}$$

  value $UCL = 0.180 + \sqrt[3]{\frac{0.180(1-0.180)}{580}} = 0.228$

- Calculating the lower control limit, often known as the LCL (LCL). The formula is used to calculate the upper control limit, or LCL:

  $$LCL = \bar{p} - \sqrt[3]{\frac{\bar{p}(1-\bar{p})}{n}}$$

- value $LCL = 0.180 + \sqrt[3]{\frac{0.180(1-0.180)}{580}} = 0.132$

P-Chart calculation table is obtained process of data analysis on the business process of lending application PT. XYZ in Jakarta in the following table:

Month	Quantity of Data Input	Quantity of Data Overdue	Percentage of data overdue	CL	UCL	LCL
Jan	580	80	0.137	0.180	0.228	0.132
Feb	620	90	0.145	0.180	0.228	0.132
Mar	570	82	0.143	0.180	0.228	0.132
Apr	450	115	0.255	0.180	0.228	0.132
May	380	90	0.236	0.180	0.228	0.132
Jun	400	115	0.287	0.180	0.228	0.132
Jul	468	102	0.218	0.180	0.228	0.132
Aug	485	125	0.258	0.180	0.228	0.132
Sep	560	100	0.178	0.180	0.228	0.132
Oct	690	90	0.130	0.180	0.228	0.132
Nov	720	88	0.122	0.180	0.228	0.132
Dec	715	115	0.161	0.180	0.228	0.132

Table 3: *P-Chart calculation of* the data analysis process on the lending application business process of PT. XYZ in Jakarta
Source: Data Processing Results (2022)

As can be observed, the proportion of faulty data that is past due in business processes is higher than the control limit. As a result, remedial steps must be taken to reduce the amount of defect data that is overdue in business processes, ensuring that nothing exceeds the control limits that have been established, in figure 1 as follows:

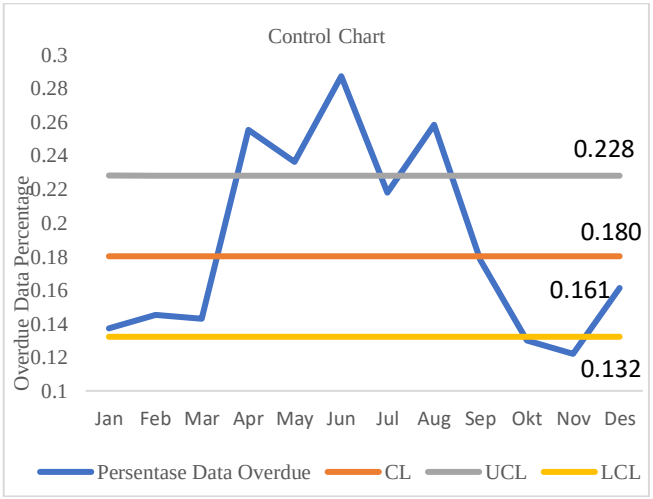

Fig. 1: *Control Chart* on the lending application business process of PT. XYZ in Jakarta

Source: Data Processing Results (2022)

The Pareto diagram for the kind of defectin the business process of giving lending to PT. XYZ in Jakarta, in figure 2 as follows:

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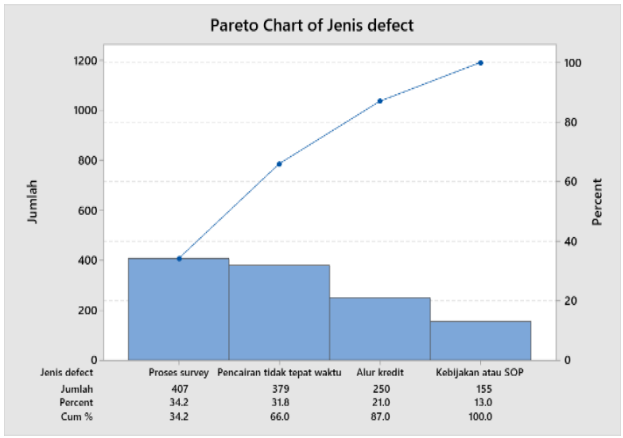

Fig. 2: Pareto diagram for the kind of defect PT. XYZ in Jakarta

Source: Data Processing Results (2022)

The process capacity study, as shown in Fig.3, Process Capability Report for Actual Lending Agreement PT. XYZ in Jakarta, yielded an index of potential capacity (Cp) of 0.12 1, indicating that the company is not capable of processing. The value of the real capacity index (Cpk) -0.43 indicates that the average process is outside the business process efficiency area's standards or tolerances, taking into account the lower and upper limits of 10 and 14 days.

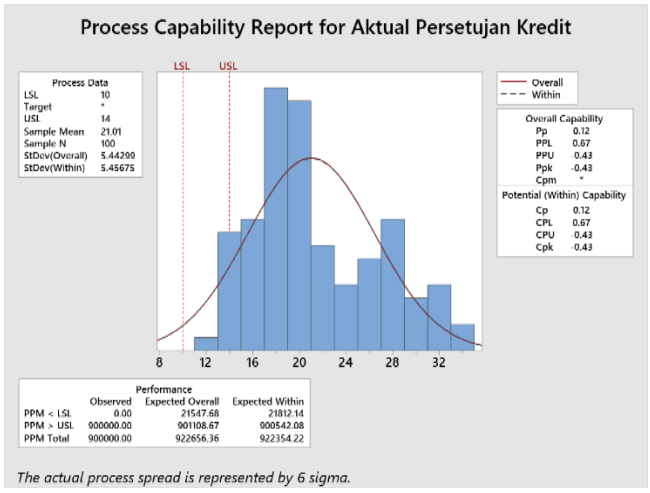

Fig. 3: Process Capability Report for Actual Lending Agreement PT. XYZ in Jakarta

Source: Data Processing Results (2022)

C. Analyze

There are 26 possible challenges in the business process and sales process of Relationship Manager Lending in applying for lending at PT. XYZ in Jakarta, according to the results of brainstorming with the Branch Manager and Area Sales Manager. After being analyzed utilizing the RCFA (Root Causes of Failure Analysis) methodology with the Branch Manager and Area Sales Manager, the issue was identified in the system's business process.

Improvements to the systems were produced through the simplification of business processes, including the improvement of knowledge and training skills through training and discussion. Fishbone analysis is a technique for determining the potential causes of four factors (4M), meaning Man, Machine, Material, and Method. (1) Man, with three major issues: (1) lack of skill and knowledge of Relationship Manager Lending in the sales process; (2) system and procedures, with the main issue being that the system is too complicated and impractical; (3) material, with issues such as not utilizing the data base and technology; and (4) the method of the problem observed has not used the customer-centric method and does not have a unique selling point. The 5 whys analysis is performed to identify the root cause of a problem because appropriate actions can be performed to resolve the issue.

In the lending application procedure of PT. XYZ in Jakarta, improvement proposals were offered, including: (1). Applicants should have completed the data and documents required when the potential debtor submits a lending application in the activity of receiving lending documents for prospective debtors who are identified as wasteful over processing categories.(2).The Lending Relationship Manager performed a corporate survey and analysis of the type of business of prospective debtors, which identified the category of waste over processing. It is proposed to improve the simplification process by possessing the lending team conduct only one survey, accompanied by the Lending Relationship Manager, Branch Manager, or Area Sales Manager.(3). It is recommended to integrate these operations into one process by checking potential debtors, analyzing guarantee coverage of potential debtors, analyzing prospective debtors' financial statements, proposing lending limits to be provided, and identifying waste over processing. (4). Checking the guarantee coverage in connection to other external units is offered as a simplification procedure utilizing a work order letter that offers clear information about the guarantee data. (5).Errors frequently occur when filling out the lending application form (FAP) in the system, causing a delay in being able to re-enter; this activity is classified as rework and waiting. It is proposed to simplify the process of system simplification and improvement by providing more directed and orderly input without having to be complicated (6). It was identified waste waiting during data and document analysis activities by the legal team and lending committee team approval, and recommended adjustments to the simplification process so that it does not take as long (7). Providing potential debtors with decision information, identifying waste motion, and recommending system improvements that are integrated with prospective debtors through direct notification messages.

D. Improve

An action plan is implemented in this step to improve the quality and productivity of PT. XYZ's Relationship Manager Lending in Jakarta. The improve phase focuses on the sales process in order to improve Relationship Manager Lending productivity and performance, specifically through an integrated solution, which is divided into three main categories: (1). By optimizing the existing database through the Branch Manager's provision of a data base from the head office because the Relationship Manager Lending PT.

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XYZ in Jakarta can build a good relationship with prospective debtors (2). Perform Activity-Based Monitoring and Productivity Tracking Enhancement for Relationship Manager Lending PT. XYZ in Jakarta, with Report entry into the system and submission every day. (3). Improving the Sales Force's Capacity Branch Managers and Relationship Managers receive extensive training to assist and improve their knowledge, abilities, and attitudes. Achieve vs. target simulation, marketing skills, role play, and other aspects of lending are included.

E. Control

a) Business Process Control

After improvements were made to the P-Chart , there was no data that was outside the control limits and all data was within the control limits in the lending granting business process of PT. XYZ in Jakarta is in good condition, in figure 4 as follows:

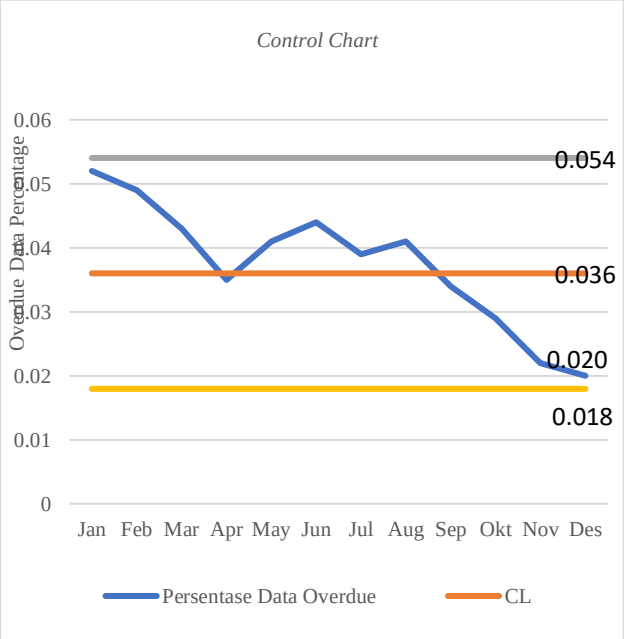

Fig. 4: Control chart improvement to the lending application business process of PT. XYZ in Jakarta

Source: Data Processing Results (2022)

After the improvement were made, the results obtained in the business process of applying for lending at PT. XYZ in Jakarta there is a time savings of 8 days or a decrease of 40%,

b) Control on the sales process Relationship Manager Lending

Results from the sales process after implementing Lean Six Sigma, the achievement of sales targets in 2021 has increased by Rp. 8.130 billion, or 8.92%, as according Relationship Manager Lending PT. XYZ in Jakarta, in the figure 5 below:

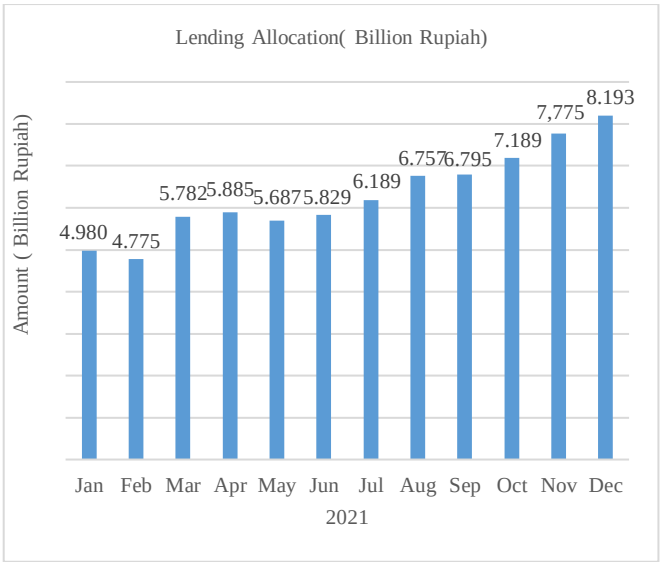

Fig. 5: Graph of Relationship Manager's target achievement Lending PT. XYZ in Jakarta in 2021

Source: Data PT. XYZ in Jakarta (2021)

V. CONCLUSIONS AND SUGESSTION

A. Conclusion

Based on the results of data analysis, the following conclusions can be drawn:

Implementation of Lean Six Sigma in the provision of lending to PT. XYZ in Jakarta , the result is that in the business process there is a time saving of 8 days or a decrease of 40%. Achievement of sales target of Relationship Manager Lending PT. XYZ in Jakarta in 2021 experienced an increase in sales of Rp. 8.130 Billion or 8.92%.

How to improve to minimize waste in extending lending to PT. XYZ in Jakarta using the Lean Six Sigma method in business processes besides simplifying into a one-time process and minimizing several activities, and in the sales process and provides integrated solutions through the provision of a customer database, productivity tracking mechanism, sales force profiling, and comprehensive training programs to develop knowledge (attitude). Overprocessing, rework, waiting, and unnecessary motion are elements of waste activities in the process of issuing lending to PT. XYZ in Jakarta.

B. Suggestion

The following are the author's recommendations regarding people who intend to conduct similar study or continue this research:

At the improvement and control stage of this research, validation from PT. XYZ is to decrease waste in business processes so that the credit application data process can be more effective and efficient according to customer needs.

The DMAIC steps (Define, Measure, Analyze, Improve, Control) of Lean Six Sigma must be implemented

continually and continuously on business processes and Relationship Manager Lending sales operations to ensure that quality is maintained and enhanced. Especially now that the financial digitization process has been completed.

For further research, it is recommended that Lean Six Sigma be implemented in other banking services, such as mortgages, to make the process more efficient and efficient in satisfying customer needs.

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